



Hanford Site

Integration Project Expert Panel

Outbrief Presentation 6th Panel Meeting January 28, 2000

**Dr. Edgar Berkey
IPEP Chairman**



Integration Project Expert Panel

Topics Covered

- **Stakeholder, Tribal Nation, and Regulator Input**
- **Science & Technology Program**
- **System Assessment Capability**
- **Modeling and Transport**
- **Subsurface Investigations**
- **Overall Status of Integration Project**



To Begin With

- 2000 is “Leap Year” -- an appropriate theme for the Integration Project
- IPEP members interacted with Integration Project presenters before the meeting
 - Now SOP



Stakeholder, Tribal Nation, and Regulator Input

- **Input from Ecology**
 - IPEP agrees with many of your comments on:
 - SAC, Rev. 0
 - SAC in general
 - Knowledge of inventory
 - Importance of Carbon Tetrachloride plume
 - Groundwater modeling
 - Regarding IPEP, we are:
 - Increasing technical review
 - Trying to work smarter within constrained budget
 - Encouraging peer review
 - We also want to increase dialogue -- within constraints of open meetings



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Science & Technology

**M. Kavanaugh
J. Conaway**



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Integration Project

- Update presented by M. Freshley and J. Zachara
- FY00 Budget \$4.7M
- EMSP Budget for FY00 ~\$10M
- Projects at an initial stage
- Too early to determine effectiveness
- S&T Roadmap being revised



Positive Directions

- EMSP projects are an impressive list
- Planning efforts clearly show linkages to site activities (soil inventory, site characterization, SAC)
- Connecting users with S&T and EMSP projects -- coordination teams



Areas of Concern

- Inherent limitations to directing EMSP project goals towards site needs
- Clear definition of priority research needs and their relation to EMSP and S&T projects
- Need to clarify end states for cleanup to establish S&T priorities
- Management and tracking of interactions between users/scientists



Areas of Concern (Continued)

- Insufficient attention to technology needs (site characterization methods, remediation)
- The first round of EMSP awards was Hanford's "shot"
-- A substantial commitment is needed



Preliminary Recommendations

- Program is on the right track
- IPEP will continue to review S&T activities; NRC scope under development
- Document benefits of S&T/EMSP projects as related to specific project activities -- IPEP, September '99
- Formalize priority setting process for S&T needs and publish those needs from various time scales



Preliminary Recommendations (Continued)

- Assess adequacy of funding for S&T based on potential savings for Hanford cleanup costs
- Increase funding of internal projects to support technology needs



System Assessment Capability

**E. Berkey
J. Karr**



Observations

- Effort is ambitious, but essential
- Sufficient detail has now been articulated to give IPEP greater comfort that a useful tool will result
- Challenge is now to become more efficient and effective -- at doing relevant analyses and communicating the results
- Large uncertainty in SAC outputs no reason not to proceed



Observations (Continued)

- Expectations from SAC need to be moderated and placed in perspective
- SAC, Rev. 0 likely to be more useful in decision-support than currently envisioned



Recommendations

- Address more fully IPEP request to provide a hypothetical but realistic example of inputs and outputs, step-by-step, including how uncertainty is handled
- As soon as possible, carry out some bounding scenario analyses that will be internally valuable
- Remain aware of but not constrained by TPA milestones -- Hanford needs SAC



Modeling and Transport

P. Wierenga
R. Bassett



Groundwater Modeling

- **Observations:**
 - The groundwater modeling group has responded well to suggestions from the outside review panel through:
 - Development of improved conceptual models of groundwater flow
 - Inverse modeling of existing data
 - Use of stochastic approach for predictions of groundwater flow
 - Hiring of staff with expertise in stochastic modeling



Groundwater Modeling

- **Recommendations:**
 - We recommend to keep strengthening the groundwater modeling group with internal expertise or outside consultants versed in stochastic hydrology
 - The function of the groundwater review panel should remain as peer review
 - We are concerned that the modeling tasks become overly computationally intensive, which could delay product delivery



Vadose Zone Modeling

- **Observations:**
 - There has been interaction with modeling groups at other national laboratories; a positive result of the integration project
 - Selection of a vadose zone flow and transport model is imminent
 - The model selection process was not well documented, and selection criteria were not well defined



Vadose Zone Modeling

- **Recommendations:**
 - Final model selection should be based, among other criteria, on how well the model can be adapted to future project needs
 - Modeling chemical processes should receive equal efforts as compared to flow processes
 - Model testing should be done with well defined field and lab data, including field tracer tests, and data from the recently completed boreholes in the tank farms



Vadose Zone Modeling (Continued)

- **Recommendations:**
 - A vadose zone monitoring program (gamma and neutron moisture logging) should be started immediately



Subsurface Investigations

J. Matuszek

R. Patt



200 Area ER Remedial Action

- Purpose -- to support remedial decisions regarding land use
- Test of streamlined subsurface investigation
 - Representative sites
 - Test pits (25 ft. depth, backhoe)
 - Confirmation with limited number of boreholes
- Data quality appears sufficient for purpose
- Approach seems to be effective, relatively inexpensive
- Follow-up on conceptual models



RPP Results

- Cooperation with RCRA, S&T and Integration Project
- Borehole 41-09-39 decommissioning (SX-108/109)
 - Innovations (sidewall sampling, camera, temperature)
 - Information obtained
 - Hottest soil samples (1.3 R/hr @ 30 cm for 400g)
 - Defined contaminant distribution (1997 gamma logs)
 - Correlation of Nitrate, Sodium, Chromium, Tc-99 and conductivity
 - High desorption values for Cs-137



RPP Results (Continued)

- Borehole 299-W23-19 (SX-115)
 - Innovations (continuous sampling to 160 ft, air-rotary, gadolinium tracer with neutron, gamma logging)
 - Information Obtained
 - Correlation of nitrate, Tc-99 and conductivity, but not chromium
 - Hottest Tc-99 in groundwater (at interface with vadose zone)
 - RCRA Wells
 - Integrated effort
 - Geologic, chemical and radiological data
 - Groundwater sampling at multiple depths



RPP Plans

- Cone Penetrometers in Tank Farm (shallow)
- SX-108 Slant Borehole
 - Geophysics (moisture, neutron, gamma, and neutron-enhanced)
 - Sediment samples (contaminants and alteration of formation soils)
 - Recommend adding temperature logging
- Temperature Sensitivity Study
- Estimates of Tank Leak Volumes



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Overall Status of Integration Project

E. Berkey



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Overall Observations/Comments

- Encouraged by overall progress and direction of Integration Project
- Project is now yielding results, not just plans
- Concerned about ability to retain momentum and meet expectations
- Evident that there is pressure to increase relevance and understanding of project work
- Decisions facing the site, other than milestones, are not clear to us



Overall Recommendations

- Role of DOE Project Manager needs to be filled on a permanent basis
- Increase the emphasis on making Integration Project output relevant to site decisions
- Revisit benefits to customers of Integration Project outputs
 - Must be understandable and meaningful
- Work on defining the hierarchy of decisions that the Integration Project can support



Integration at Hanford

